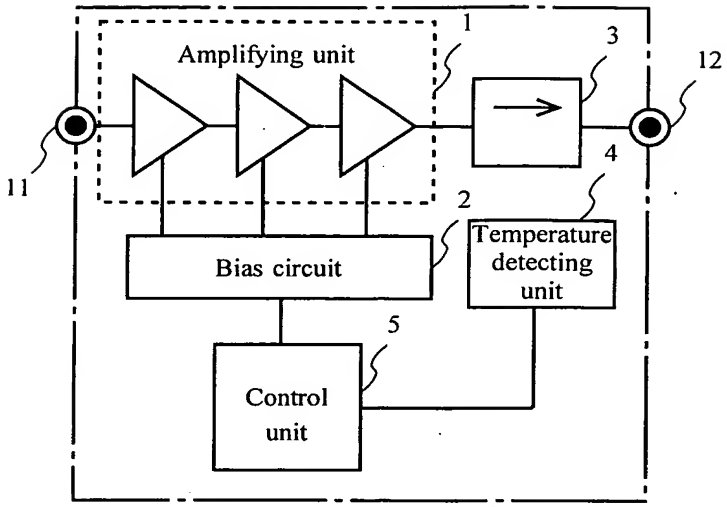
Amplifying unit
1
3
12
11
4
2
Temperature detecting unit
Bias circuit
5
Control unit

Fig.1

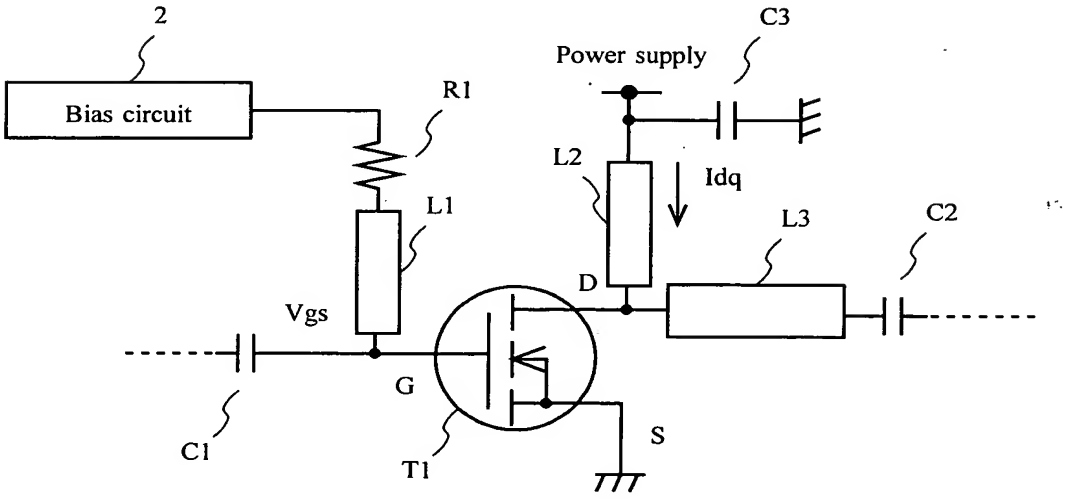
2
Bias circuit
R1
C3
Power supply
L2
Idq
L1
L3
C2
D
Vgs
G
C1
T1
S

Fig.2

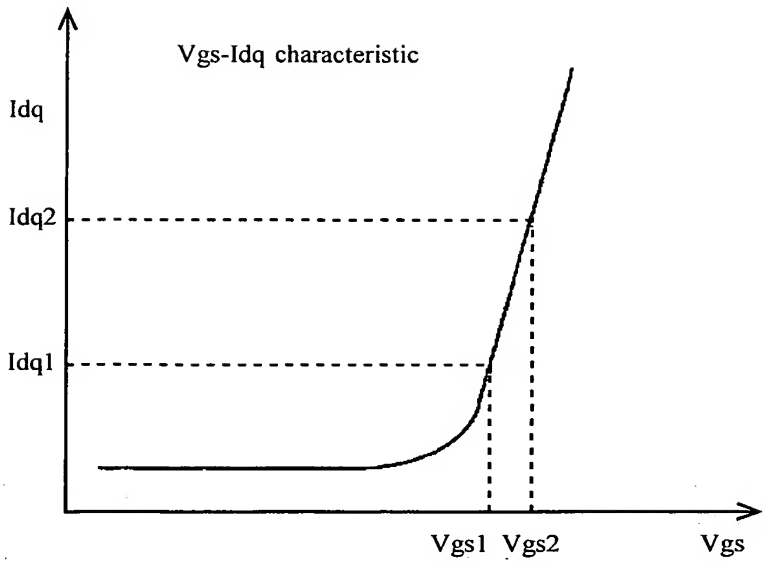
Vgs-Idq characteristic
Idq
Idq2
Idq1
Vgs1
Vgs2
Vgs

Fig.3

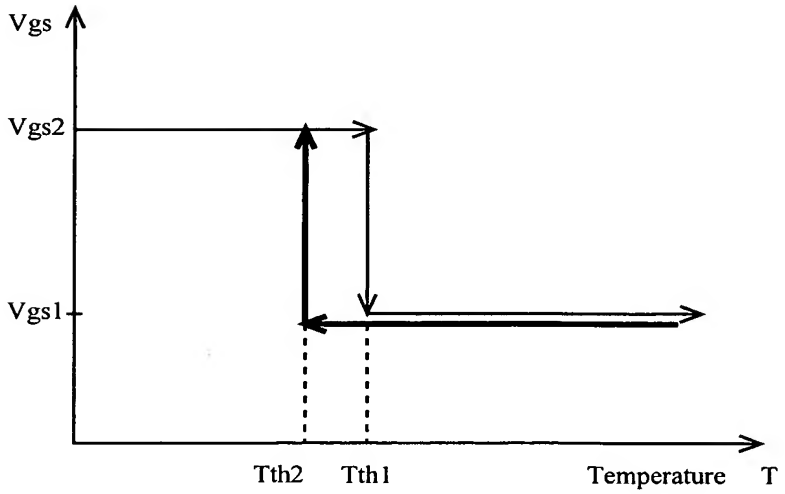
Vgs
Vgs2
Vgs1
Tth2
Tth1
Temperature
T

Fig.4

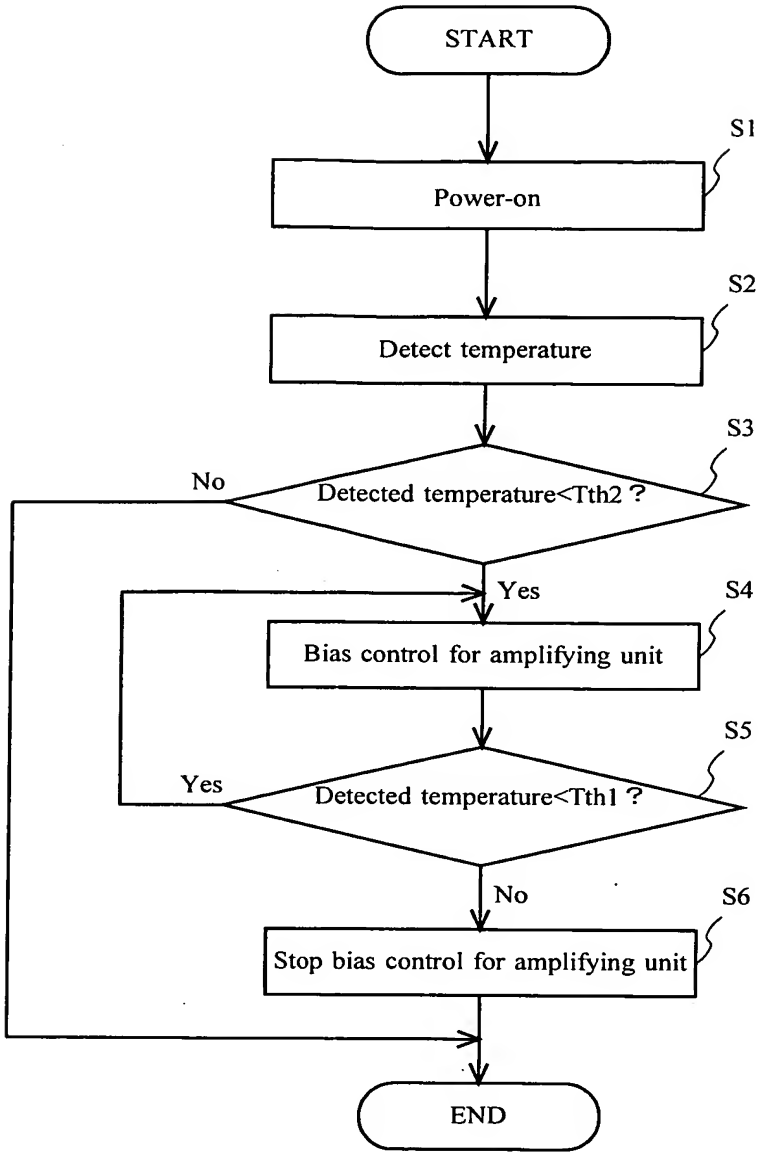
START
S1
Power-on
S2
Detect temperature
S3
No
Detected temperature<Tth2 ?
Yes
S4
Bias control for amplifying unit
S5
Yes
Detected temperature<Tth1 ?
No
S6
Stop bias control for amplifying unit
END

Fig.5

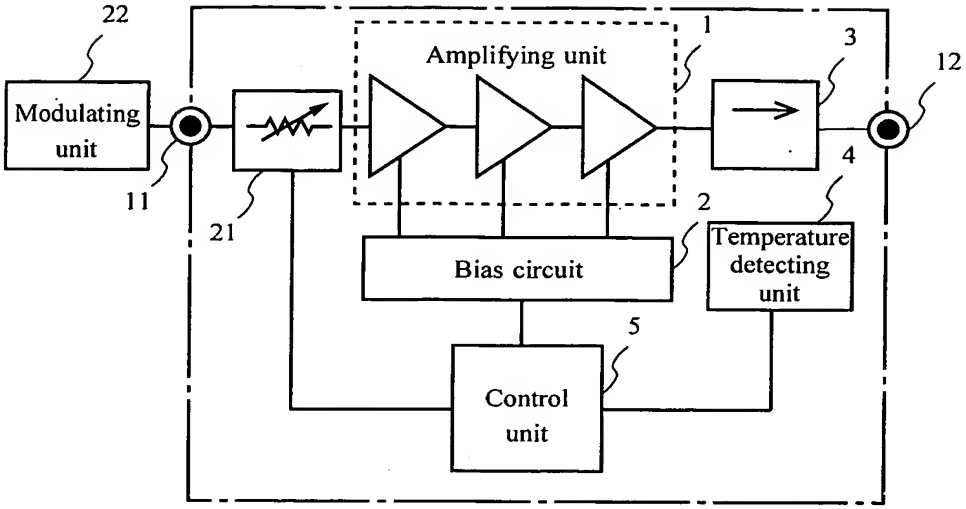
22
Modulating unit
11
21
Amplifying unit
1
3
12
4
2
Temperature detecting unit
Bias circuit
5
Control unit

Fig.6

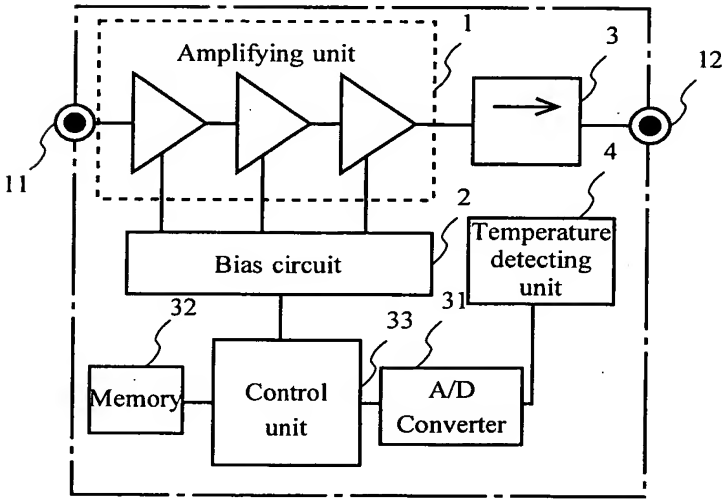
Amplifying unit
1
3
12
11
4
2
Temperature detecting unit
Bias circuit
32
31
33
Memory
Control unit
A/D Converter

Fig.7

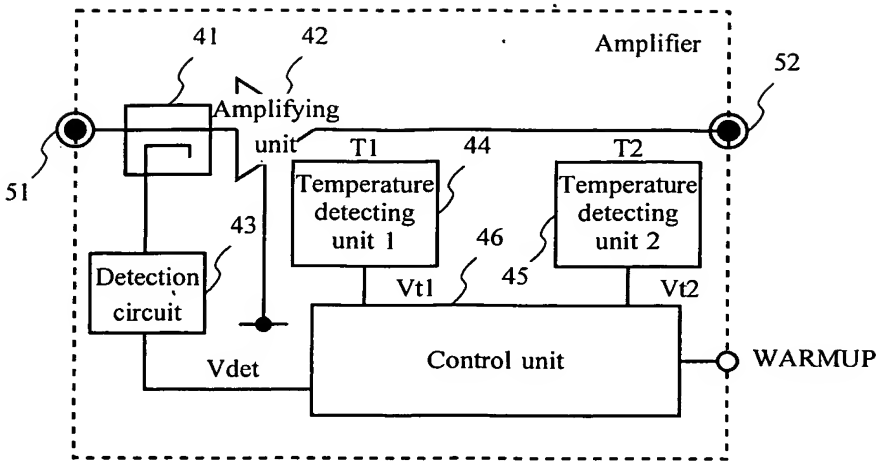
41
42
Amplifier
52
Amplifying
unit
T1
44
T2
51
Temperature
detecting
unit 1
Temperature
detecting
unit 2
43
46
45
Detection
circuit
Vt1
Vt2
Vdet
Control unit
WARMUP

Fig.8

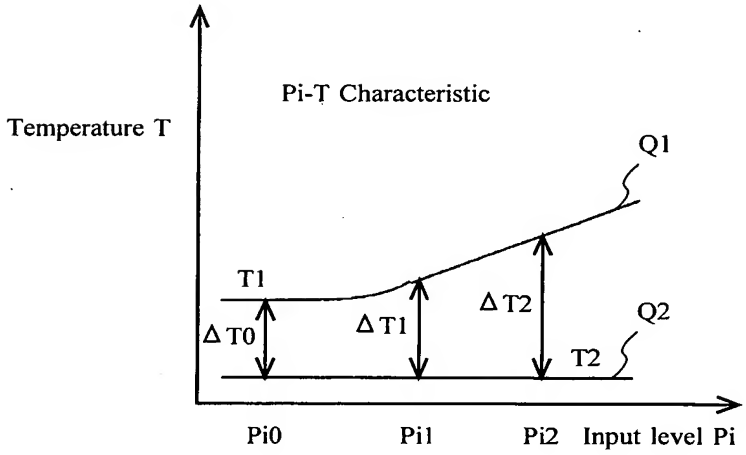
Pi-T Characteristic
Temperature T
Q1
T1
ΔT0
ΔT1
ΔT2
Q2
T2
Pi0
Pi1
Pi2
Input level Pi

Fig.9

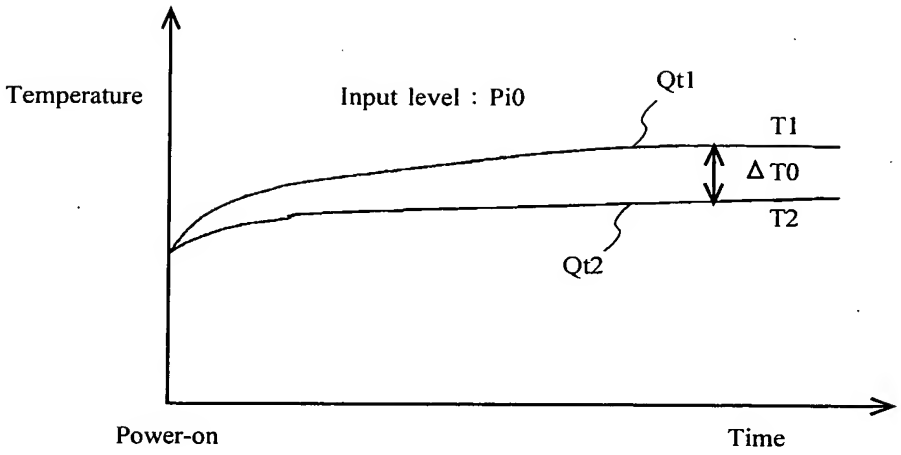

Fig.10

Judgment criteria table	
Input level Pi	Temperature difference ΔTi
Pi0<Pi<Pi1	ΔT0
Pi1<Pi<Pi2	ΔT1
Pi2<Pi	ΔT2

Fig.11

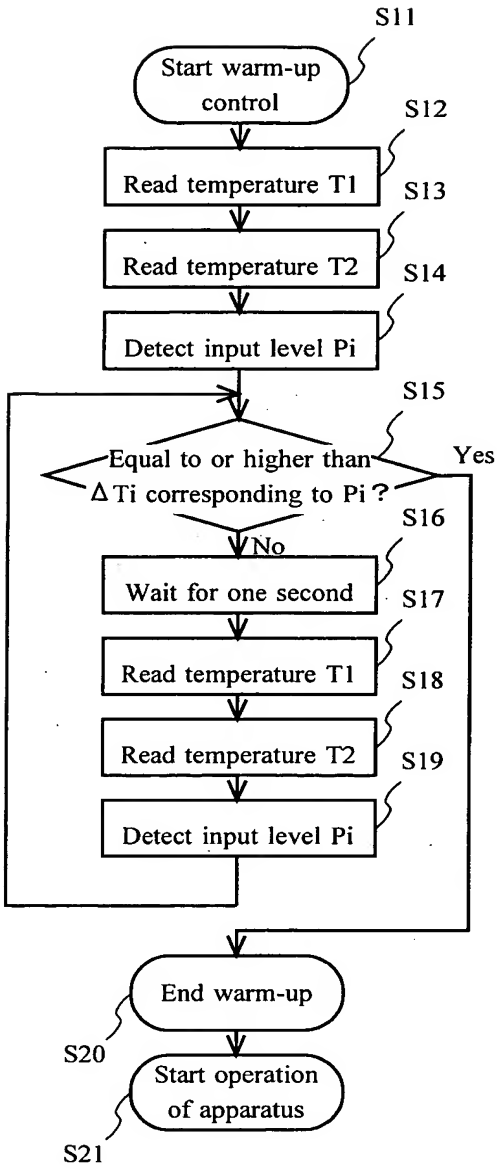
S11
Start warm-up control
S12
Read temperature T1
S13
Read temperature T2
S14
Detect input level Pi
S15
Equal to or higher than ΔTi corresponding to Pi?
Yes
No
S16
Wait for one second
S17
Read temperature T1
S18
Read temperature T2
S19
Detect input level Pi
End warm-up
S20
Start operation of apparatus
S21

Fig.12

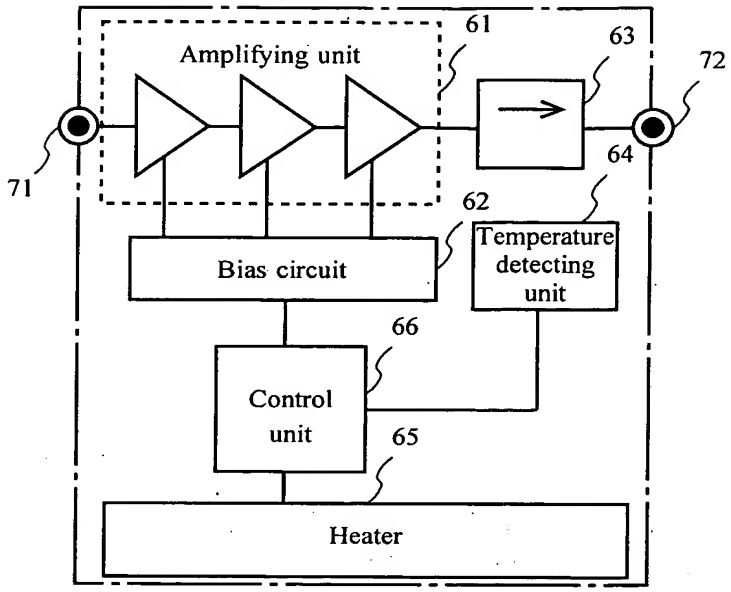
61
Amplifying unit
63
72
71
64
62
Temperature detecting unit
Bias circuit
66
Control unit
65
Heater

Fig.13